Spontaneous subarachnoid hemorrhage

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- Continuous Intravenous Nimodipine Infusion With Ethanol as Carrier in Aneurysmal Subarachnoid Hemorrhage Does Not Result in Measurable Cerebral Ethanol Levels
- Role of Magnetic Resonance Venography in the Evaluation of Cerebral Veins and Sinuses Occlusion
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- Comprehensive predictive modeling in subarachnoid hemorrhage: integrating radiomics and clinical variables
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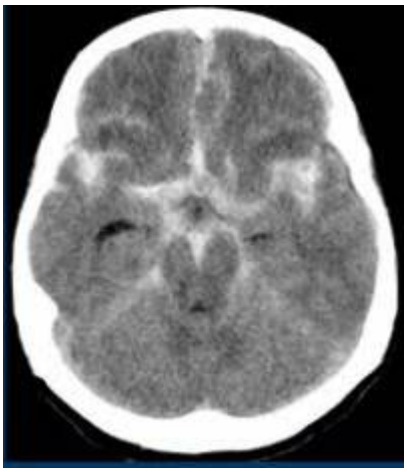

Epidemiology

Spontaneous subarachnoid hemorrhage epidemiology.

Classification

Spontaneous subarachnoid hemorrhage classification.

Risk factors

Hypertension

oral contraceptives

substance abuse

cigarette smoking

following cocaine abuse

alcohol consumption: controversial

diurnal variations in blood pressure

pregnancy and parturition

slight increased risk during lumbar puncture and/or cerebral angiography in patient with cerebral aneurysm

slight increased risk with advancing age

Oral Anticoagulant

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conditions with an increased incidence of cerebral aneurysms

An adverse lipid profile seems to elevate SAH risk similar to its effect in other cardiovascular diseases, especially in men. Whether SAH incidence diminishes with increasing statin use remains to be studied [1)].

Some case reports on the association of the COVID-19 infection and occurrence of spontaneous subarachnoid hemorrhage (SAH) have been reported [2)].

Pathophysiology

The extent and nature of impairment in autoregulation accurately predicts neurologic complications on an individual patient level, and suggests potentially differential impairments in underlying physiologic mechanisms. A better understanding of these can lead to targeted interventions to mitigate neurologic morbidity [3)].

Clinical features

see Subarachnoid hemorrhage clinical features

Differential diagnosis of severe, acute, paroxysmal headache (25% will have SAH):

subarachhnoid hemorrhage. AKA “warning headache” or sentinel H/A

benign “thunderclap headaches” (BTH) or crash migraine“, severe global headaches of abrupt onset that reach maximal intensity in < 1 minute, accompanied by vomiting in e 50%. They may recur, and are presumably a form of vascular headache, some may have transient focal symptoms. There are no clinical criteria that can reliably differentiate these from SAH. There is no suharachnoid blood on CT and LP, which should probably be performed on at least the first presentation to R/O SAH. Earlier recommendations to angiogram these individuals have since been tempered by experience.

reversible cerebral vasoconstrictive syndrome (RCVS) (AKA benign cerebral angiopathy or vasculitis) severe H/A with paroxysmal onset, ± neurological deicit.

Diagnosis

Spontaneous subarachnoid hemorrhage diagnosis.

Spontaneous subarachnoid hemorrhage management

Spontaneous subarachnoid hemorrhage management

Prognosis

Spontaneous subarachnoid hemorrhage prognosis.

Complications

Subarachnoid hemorrhage complications.

Retrospective cohort studies

The study cohort was 837 patients with spontaneous subarachnoid hemorrhage (SAH) and one or multiple aneurysms, admitted to Dept of Neurosurgery, Uppsala University Hospital from 2012 to 2021. Demography, location and treatment of aneurysms, neurologic condition at admission and discharge, mortality and last tier treatment of high intracranial pressure (ICP) was evaluated. Functional outcome was measured using the Extended Glasgow Outcome Scale (GOSE) Data concerning national incidences of stroke diseases was collected from open Swedish databases.

Results: Endovascular methods were used in 666 cases (79.6%). In 111 (13.3%) with stents. Surgery

was performed in 115 cases (13.7%) and 56 patients (6.7%) had no aneurysm treatment. The indications for surgery were a hematoma (51 cases, 44.3%), endovascular treatment not considered safe (47 cases, 40.9%), or had been attempted without success (13 cases, 11.3%). Treatment with stent devices increased, and with surgery decreased over time. There was a trend in decrease in hemicraniectomias over time. Both the patient group admitted awake (n = 681) and unconscious (n = 156) improved significantly in consciousness between admission and discharge. Favorable outcome (GOSE 5-8) was seen in 69% for patients admitted in Hunt & Hess I-II and 25% for Hunt & Hess III-V. Mortality at one year was 10.9% and 42.7% for those admitted awake and unconscious, respectively.The number of cases decreased during the study period, which was in line with Swedish national data.

Conclusions: The incidence of patients with SAH gradually decreased in our material, in line with national data. The treatment policy in our unit has been shifting to more use of endovascular methods. During the study period the use of hemicraniectomies decreased [4)]

Case series

Küchler et al., retrospectively reviewed 87 sSAH patients with WFNS (World Federation of Neurosurgical Societies) grade III-IV, who received tracheostomy. Decannulation events and the time from tracheostomy to decannulation were recorded in a 200-days follow-up. Variables analyzed were: age, sex, WFNS grade, Fisher grade, the presence of intracerebral or intraventricular hematoma, acute hydrocephalus, aneurysm location, aneurysm obliteration (surgical vs. endovascular), treatment related complications, decompressive craniectomy, symptomatic cerebral vasospasm, vasospasm-related infarction and timing of tracheostomy. Further risk factors analyzed were preexisting chronic lung disease and pneumonia. Functional outcome was assessed by the modified Rankin Scale (mRS).

The rate of successful decannulation was 84% after a median of 47 days. A higher WFNS grade and pneumonia were associated with both a prolonged time to decannulation (TTD) and decannulation failure (DF). Older age (> 60 years) and necessity for decompressive craniectomy were only associated with prolonged TTD. Outcome analysis revealed that patients with DF show a significantly ($p < 0.01$) higher rate of unfavorable outcome (mRS 3-6).

Successful decannulation is possible in the majority of sSAH patients and particularly, in all patients with WFNS grade III. WFNS grading, age, the necessity for decompressive craniectomy and pneumonia are significantly associated with the TTD. WFNS grade and pneumonia are significantly associated with DF. The mean cannulation time of sSAH patients is shorter in relation to stroke patients [5)].

Case reports from the HGUA

Spontaneous Subarachnoid Hemorrhage with Negative Angiography A Favorable Clinical Evolution

Abstract: We present the case of a 39-year-old male admitted for spontaneous subarachnoid

hemorrhage (SAH) classified as Hunt-Hess II and Fisher III. Initial cerebral angiography revealed no vascular malformations. During hospitalization, the patient exhibited favorable clinical progression without neurological deficits. Control imaging demonstrated resolution of hemorrhagic findings. The case highlights the management and positive outcome of angiographically negative SAH.

Introduction: Spontaneous subarachnoid hemorrhage (SAH) is commonly associated with aneurysmal rupture. However, up to 15–20% of cases present with negative angiographic findings. These cases require close monitoring due to potential delayed complications, including vasospasm and rebleeding. We describe a case of angiographically negative SAH with a benign course.

Case Presentation: A 39-year-old male (José Francisco Soler Asensi, SIP 3612173) was admitted on April 16, 2025, to the Hospital General Universitario de Alicante with sudden-onset headache and no focal neurological deficits. Initial evaluation classified the hemorrhage as Hunt-Hess II and Fisher III.

Baseline CT revealed blood within the basal cisterns, without hydrocephalus or midline shift. Cerebral arteriography performed on April 22, 2025, showed no evidence of aneurysm or vascular malformation.

Clinical course during hospitalization:

Afebrile with stable vital signs (latest recorded 37.1°C; BP 115/79 mmHg).

Persistent mild headache, controlled with analgesics.

No development of focal neurological deficits.

Tolerated oral intake well and ambulated independently.

Control CT on April 25, 2025, showed almost complete resolution of subarachnoid blood, no hydrocephalus, and preserved ventricular anatomy.

Laboratory results on April 22 showed slight elevation of C-reactive protein (1.85 mg/dL) but otherwise normal hematology and biochemistry profiles.

The patient remained neurologically stable throughout the hospital stay and continued under close neurological monitoring.

Discussion: Angiographically negative SAH carries a generally favorable prognosis compared to aneurysmal SAH but still warrants diligent observation. Risk of complications such as vasospasm necessitates imaging and clinical follow-up. Our patient's outcome exemplifies the benign course expected in such cases, with full clinical recovery and radiological resolution of hemorrhage.

Planned follow-up includes:

Repeat cerebral arteriography around May 6, 2025, to exclude delayed vascular findings.

Doppler transcranial ultrasound monitoring for vasospasm.

Conclusion: This case illustrates the favorable evolution of a spontaneous subarachnoid hemorrhage with negative angiography, emphasizing the importance of cautious monitoring and sequential imaging despite the absence of initially identified vascular anomalies.

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